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User manual

APP 521

895232_APP521_user_eng_rev1_02

This manual is applicable to the following APP 521 versions:

Hardware:

Operator panel: AFH1801 Rev 1.02
I/O-module: AHH1801 Rev 1.02
Com-module: TMX1801 Rev 1.00

System Software: 2,20

Application: 1.10

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This document may be changed without any prior notice.

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1. Read this first

Before starting using the APP 521 read this chapter carefully. It contains general information on documentation, safety and guarantee.

1.1. Product documentation

Documentation delivered with the APP 521. Check that this manual version is applicable to the delivered APP 521 version (see cover inlet).

1.2. Safety rules for the owner/ operator

- All government regulations, local health and safety directives must be observed.
- All danger due to electricty must be avoided.

1.3. Guarantee

- Modifications or changes to the unit/installation should be done only after consulting Flygt.
- Genuine spare parts and accessiories authorized by the manufacturer are essential for compliance with the terms of the guarantee. The use of other parts may invalidate the guarantee.

1.4. This manual

IIn order to avoid repetition of information, this manual describes how information regarding one pump P1, should be read or entered. If a second pump P2, is included in the installation, the corresponding steps must be repeated on it.

1.4.1. Symbols used

Safety instruction

Personal safety.

Safety instruction

Personal safety - dangerous voltage.

Special attention value

Risk of apparatus or component damage.

Special information about a function.

Information concerning the Central system.

Information about alarms.

1.4.2. Abbreviations

CS = Central system

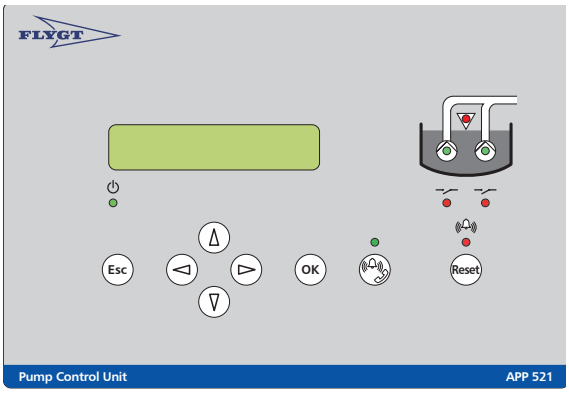
SCADA = Supervision Control And Data Acqvicition

2. Introduction

The APP 521 is a pump controller that consists of two parts, i.e. a DIN rail-mounted I/O module and a operator panel.

The APP 521 can use a modem, GSM or radio to communicate with a SCADA system e.g. the AquaView. A special communication module is available for this purpose.

2.1. Operator panel



See "Explanation of LEDs" on page 9 for an explanation of the functions.

Power/ stand-by LED

Alarm status LED

Relay status LED

Pump status LED

High level LED

Display

2.2. Push buttons

The push buttons on the panel are used to select different menus and to edit parameter values.

Esc Escape

Left arrow

Right arrow

Up arrow

Down arrow

OK OK

Remote alarm On/Off

Reset Reset

2.3. Menu groups and menus

The control parameters and the alarms are shown on the display on the front panel.

Every menu has it own name that describe the function.

Three dots after the menu name (**MENU NAME ...**) indicates that there are submenus available.

N.B. Menu 2 to 4 have no dots but have submenus available.

See **"Appendix A: List of menu" on page 32** for a complete list of menus.

2.3.1. Menu level indicator

In addition to being identified by its name, each menu is also identified by its level and ordinal number (1_1_, 1_2_, 1_3_ etc.). This menu level Indicator is shown for 1 seconds only.

2.4. Viewing a menu

- To advance one menu at a time:

Press repeatedly until the desired menu is displayed.

- To scroll backwards one menu at a time:

Press repeatedly until the desired menu is displayed.

- To display the first menu in a submenu group:

Press OK.

- To return to the last menu shown in the previous menu group:

Press and release.

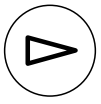
2.5. Changing a parameter

- First display the appropriate menu.:

Press the **OK** button. A flashing cursor will appear.

If canging of the valud is not allowed, the "Read only" message will be displayed instead.

If the value is numerical, advance to the required position in the menu window.



Advance with the **Right** arrow

To select a higher value, press the **Up** arrow button until the required value is displayed.

To select a lower value press the **Down** arrow button until the required value is displayed.

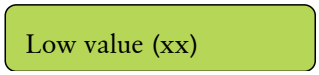
For text menus, the next available alternative is displayed instead of a value.

To save a specified value:

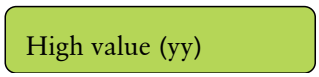
Press the **OK** button.

Depending on the result, one of the following messages will be displayed:

The value has been saved.



The value is below the permissible range (shown in the display - xx). Enter a higher value.



The value is above the permissible range (shown in the display - yy). Enter a lower value.

The message **Store failed** may be displayed in exceptional cases if the internal communications circuits are busy. Repeat the procedure until the value is saved.

To exit the menu without saving the value

Press the **Escape** button.

2.6. Show hidden service menus

Menus that are used only during installation are not shown by default.
To show these menus, set the value in the **SHOW MORE MENUS** menu to **YES**. If the password function is in use, enter the password instead in the **SHOW MORE MENUS** menu

N.B. The backlight is switched off if the display has been idle for ten minutes. If open, the **SHOW MORE MENUS** menu will close automatically and the **ALARM LOG** menu ("Home") will be displayed.

2.7. Miscellaneous buttons

Shifts to the remote alarm handling state i.e. if remote alarm handling state is on alarms will be transmitted to the central system or to the short message service (SMS).

Acknowledge a new alarm. The alarm is not removed from the alarm log.

2.8. Language

The display language can be selected in the language menu. The following languages are available:

English	German	Dutch
French	Danish	Swedish
Norwegian	Spanish	Hungarian
Finnish	Italian	Polish

A special character will be displayed in the top left corner of the language menu.

2.9. Explanation of LEDs

	LED	ON	Flash	Cause
	Power/ Stand-by	Off Green		The power supply is off or a fuse is blown. The power supply is on.
	Alarm reset	 Red	Red	A new alarm has occurred. The new alarm has been acknowledged but is still active.
	Relay state	Green Red	 Red	The pump relay is activated. The pump is blocked. Possible causes: • Auto mode input is passive. • Pump is blocked by software. • Remote blocking is active. • Low level is active. • EX mode blocking is active. Power on delay, the pumps are blocked.
	Pump status	Green Red	 Red	The pump is running. The feedback signal from the relay is active. The pump is faulty. Possible causes: • High temperature. • Motor protection has tripped. The power supply phases are connected in the wrong sequence or one phase is dead.
	High level	Red		The level in the sump is high. Possible causes: • The high level float is active. • The analogue sensor value is above the high level alarm limit.
	Local/remote LED	Green	 Green	Remote alarm is on and the RTU is ready to dial. An alarm is about to be dialed out.

3. Configuration of the APP 521

3.1. Configuration of the I/O-module

3.1.1. Connection

The I/O-module is connected to the operator panel through a cross-over FTP (Foil-shielded Twisted Pair) or an STP (Shielded Twisted Pair) Cat.5 cable.

3.1.2. Mac address

The operator panel communicates with the I/O-module using IP/Ethernet.

1. Go to the **I/O SETUP** menu and press **OK**.
2. Proceed to the **I/O MODULE** menu and press **OK**.
3. Continue to the **I/O MODULE MAC ADDR** menu and press **OK.**
4. Read off the Mac address from the label placed on the I/O board housing e.g. 255.240.17.
5. Enter the Mac address in the **I/O MODULE MAC ADDR** menu and press **OK.**
6. Value stored.

3.1.3. IP address

The RTU system uses two consecutive IP addresses. Enter the first IP address in the menu **Base IP address**. The second address is automatically assigned to the I/O-module by the display panel.

When the operator panel and I(O unit form a local network, i.e. are connected directly to each other by a cable, any of the following free addresses can be used.

- 10.0.0.0 to 10.255.255.255
- 172.16.0.0 to 172.31.255.255
- 192.168.0.0 to 192.168.255.255

If the units are connected to an intranet, two consecutive addresses must be obtained from your network administrator.

An IP address, the Base IP address, is required for the operator panel. After this address has been entered into the panel, the program will automatically assign the address to the I/O-module connected to the operator panel. All IP addresses must be in a consecutive order.

1. Continue to the **BASE IP ADDRESS** menu.
2. Enter the IP address in the **BASE IP ADDRESS.**
3. Value store.

3.1.4. IP time-out

The communication time-out menu can be adjusted in the menu **IP TIME-OUT**. The default value is appropriate for most installations.

3.2. Level control

Pump operation is controlled by either :

- Level switches (digital signals).
- Level sensor (analogue signal). The level sensor could be a pneumatic sensor or an ultrasonic sensor, both of which deliver a 4 - 20 mA current signal to the RTU.

1. Display the **GENERAL** menu and press **OK**.
2. Display the **CONTROL MODE** menu and press **OK**.
3. Select the required function and press the **OK** button.
4. Value stored.

Level measurement	Settings to be finalized
Level switch	Analogue/Digital control
	Stop condition
	Run time (if Run on time is selected
Level sensor	Analogue/Digital control
	Sensor range
	Start level 1
	Stop level 1
	High level

The '**Yes**' option must first be selected in the **SHOW MORE MENUS** menu to obtain access to the menus.
The **Level** menu is shown only if analogue control is selected.

3.2.1. Level switch control

One or two start level switches may be used.
The pump can be stopped by one of two methods available.

Select **Run on time** and enter the running time in the **RUN TIME** menu. Counting down of the time will start when pumping has taken place to the level at which the start level switch has reverted to its normal position.

If the installation includes a stop level switch, select Stop level switch in the **STOP CONDITION** menu.

3.3. Level sensor control

3.3.1. Setting the level sensor

1. Display the **SENSOR RANGE** menu.
2. Enter the maximum measuring range for the sensor. The maximum permissible value is 99.99 metres.

3.3.2. Calibrating the level sensor

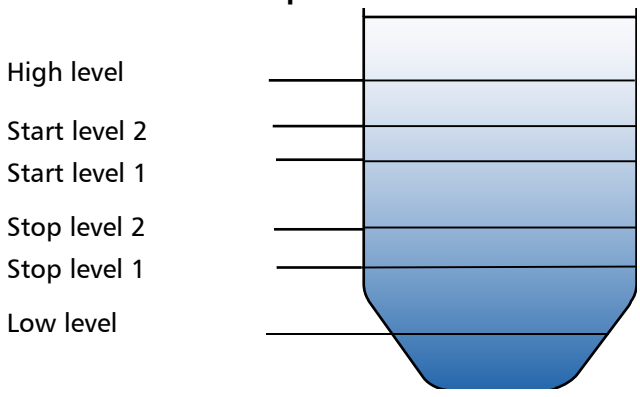
If necessary, the zero point can be adjusted in the **CALIBRATION** menu.

To calibrate, proceed as follows:

1. Raise the sensor out of the water.

2. Adjust the value in the **CALIBRATION** menu until the **LEVEL** menu shows +00.00 or some other required value. Example: The level shown is +00.20 m.
Set **CALIBRATION** to -00.20 m. LEVEL will now read +00.00 m.

3.3.3. Start and stop levels



The start and stop levels determine when a pump starts and stops.

1. Display the **LEVEL** menu.
2. Press the **OK** button to display **START LEVEL 1**.
3. Press OK.
4. Enter a start level and press the **OK** button.
5. Advance to **STOP LEVEL 1.**
6. Press OK.
7. Enter a stop level and press the **OK** button.
8. Repeat step 5 - 7 for **START LEVEL 2** and **STOP LEVEL 2.**

N.B. The **START LEVEL 1** and **STOP LEVEL 1** control the starting and stopping of the first pump. Setting both values to **0** disables the pump.

The **START LEVEL 2** and **STOP LEVEL 2** control the starting and stopping of the second pump. Setting both values to **0** disables the pump.

The application is 'emptying' i.e. Stop level < Start level < High level

If the measured level is below the value in the **LOW LEVEL** menu, the pumps are blocked.
The value **0** disables this function.

Which pump is first and which is second, depends on the pump alternation setting.

If the level settings are outside the sensor range or are mutually incorrect a parameter error alarm will be generated.

If the measured level is above the value in the **HIGH LEVEL** menu, a high level alarm will be generated.

If the measured level is below the value in the **LOW LEVEL** menu, a low level alarm will be generated.

3.3.4. Stop delay

Stopping of the first pump is delayed by the time entered in the **STOP DELAY** menu.

Alternatively a range to be pumped below the stop level can be entered in the **STOP DELAY RANGE** menu. In this case the stop delay time is calculated automatically by the RTU, which overwrites any previously entered value in the **STOP DELAY** menu.
The maximum calculated value is 10 minutes.

The value **0** disables the calculation.

1. Display the **PUMP CONTROL** menu.
2. Press the **OK** button to display the **STOP DELAY TIME** menu.
3. Press **OK.**
4. Enter a stop delay time and press the **OK** button.

Alternatively a range to be pumped below the stop level can be entered in the **STOP DELAY RANGE** menu.

1. Advance to the **STOP DELAY RANGE** menu.
2. Press **OK**.
3. Enter the stop delay range and press the **OK** button.

N.B. In this case the stop delay time is calculated automatically by the RTU, which overwrites any previously entered value in the **STOP DELAY** menu. The maximum calculated value is 10 minutes.
The value **0** disables the calculation.

3.4. Current measurement and alarms

A separate 0 - 1A AC current transformer is used for current measurement and for the current alarms.

3.4.1. Current measurement

Connect the current transformer to the current input terminals.

1. Display the **P1 CURRENT / P2 CURRENT** menu.
2. Press the **OK** button.
3. Display the **P1 MAX CURRENT / P1 MAX CURRENT** menu.
4. Press **OK**.
5. Enter the rating of the current transformer and press **OK**.

3.4.2. High current and low current

The alarm functions activate an alarm when the current exceeds any of the limitations represented by the set points.

1. Display the **P1 CURRENT** menu.
2. Press the **OK** button.
3. Display the **P1 high current** menu.
4. Press **OK**.
5. Enter the value and press the **OK** button.
6. Advance to the **ALARM LIMIT** menu.
7. Enter the value and press the **OK** button.

To disable the functions enter '0' in each menu.

The alarms are delayed by the general alarm delay.

3.4.3. Automatic motor protection reset

The Automatic Reset function allows the motor protection to cool for 3 minutes and it then tries to reset the motor protection once.
Should the restarting attempt fail the pump will remain blocked.

Press the **Reset** button on the front panel to manually reset the motor protection.

N.B. The motor protection can be reset from the central system by sending the reset command.
Enable the Automatic Reset function by settling to '*Yes*' in the **AUTOMATIC RESET** menu.

3.5. Max. run time

The maximum allowed pump running time can be limited to a preset value.

1. Display the **PUMP CONTROL** menu.
2. Press the **OK** button.
3. Display the **Max. RUN TIME** menu.
4. Press **OK**.
5. Set the required value (range 0 to 50 minutes).and press the **OK** button.

The function can be disabled by entering **0** in the menu i.e. there is no limit for the maximum pump running time.

After the time has elapsed an alarm will be generated and the pump will be stopped.

The value set in the **MAX. RUN TIME** menu must exceed a pumping cycle. When estimating the duration of a pumping cycle, also consider any additions made for the following functions.

- Stopping delay (when analogue control is used).
- Running time (when digital control is used and the Stop condition is Run on time).
- High level run time (backup control).

3.5.1. External alarm

An external unit can be connected to a General-Purpose input. When the circuit is closed, an external alarm will be generated and recorded in the alarm log.

When a general input is configured as an External alarm the following will apply:

General input 1	becomes	External alarm 1
General input 2	becomes	External alarm 2
General input 3	becomes	External alarm 3
General input 4	becomes	External alarm 4

In addition if the RTU uses an analogue sensor for level control, the following inputs will automatically be reassigned as external alarm inputs:

Stop level switch	becomes	External alarm 5
Start level switch 1	becomes	External alarm 6
Start level switch 2	becomes	External alarm 7

Each extern alarm can have a customized alarm text. The texts must be entered in the **ALARM TEXT INPUT 1-7** menus**.** If the first character of the alarm text is left blank, the standard alarm text will be used instead. The alarm text can contain extended ASCII characters. e.g. öøé

N.B. The local alarm texts can be changed from the central system.
The corresponding alarm texts can be set in the central system, using the alarm code filter function.

3.5.2. Personnel alarm

The alarm is designed to give warning of the risk of an accident that may occur in a risk area, e.g. a pump station, if a certain defined working time has been exceeded.

The function involves a selector switch, usually a switch for the lighting in the pump station, being connected to a General-Purpose input. By turning on the lights when the work begins the selector switch will be activated.

When the circuit has been closed for the time specified in the **WORKING TIME** menu, the common alarms output will bee activated and the Warning time set in the **WARNING TIME** menu will begin to run.

If everything is OK the personnel can extend the Working time by briefly opening the General-Purpose input (by switching the lighting off and on) or by pressing the **Reset** button on the RTU panel, and the counting of the Working time will then be restarted.

The required values are set in the **WORKING TIME** and **WARNING TIME** menus.

At the end of the preset **Warning time**, the personnel alarm will be sent out to the central system or the SMS. (provided that the RTU is equipped with a Communication module

The personnel alarm always has alarm priority **A** and cannot be prevented from being activated.

3.5.3. Blocking

When the General-Purpose is active, the pumps will be blocked to prevent them from starting.

3.5.4. Overflow sensor

The General-Purpose serves as the input for an overflow sensor. The accumulated overflow time and the number of overflow occasions are recorded and can be read in the **OVERFLOW COUNT** and **OVERFLOW TIME** menus.

The recorded values in the two menus can be reset.

N.B. The daily number of overflows and the overflow time values can be read in the central system status. The number of overflows and the overflow times are available as reports.

3.5.5. Low level float

Select this function when the input is connected to a low level switch.

The pumps are blocked directly by this signal. The alarm is delayed by the Low level alarm delay

1. Display the **ALARM SETUP** menu.
2. Press the **OK** button.
3. Display the **LOW LEVEL ALARM DELAY** menu.
4. Press **OK**.
5. Set the required value (range 0 to 25 sek) and press the **OK** button.

3.5.6. Power failure

Select this function when the input is connected to an external device for supervising the power supply e.g. Phase control.

When the signal is active the pumps will be blocked to prevent starting.

3.5.7. Rain meter

The input is connected to a rain meter.

Enter the scale factor for your particular rain meter e.g. a rain meter is specified to give 0.2 mm/pulse. Enter 0.2 in the **RAIN SCALE FACTOR** menu.

The daily value can be read in the display.

When the 5 minute average value exceeds the value in the **RAIN ALARM 5 MINUTE** menu an alarm will be generated.

When the daily rain value exceeds the value in the **RAIN ALARM 24 HOUR** menu an alarm will be generated.

The rain 5 minute average value is available as a trend.
The actual daily value can be read in the central system status.
The rain alarm state is indicated in the central system status.

3.5.8. P1 Leakage, P2 Leakage

Select this function if the input is connected to a leakage sensor through a CAS, mini-CAS or MAS. The P1 tripped and P2 tripped inputs are assumed also to be connected to the same device.

When the input is active a pump leakage alarm will be generated.

If the P1 tripped or P2 tripped goes active and the Auto reset function is enabled, the RTU will automatically reset the device connected to outputs 2 and 4 respectively.

3.5.9. P1 Spare alarm, P2 Spare alarm

Select this function when the input is connected to an external device that supervises the pump.

3.5.10. P1 Manual, P2 Manual

Select this function if the RTU is to control the manual mode of the pumps.

In EX-mode the general inputs 3 and 4 are automatically assigned as P1 manual and P2 manual.

3.6. Miscellaneous

3.6.1. Power failure

The power supply is supervised by the MIO501, which results in 2 signals.

Signal	24V unit	230V unit with 24V battery.
230V fail	*	The supply is dead
24V fail	24V supply is low or dead.	The battery is low.

* A 230V unit can be supplied through the 24V supply. In that case the 230V fail signal must be inverted in order to avoid the 230V failure alarm.

3.6.2. Emergency operation output

When the RTU is in normal operation the emergency operation output disconnects the emergency operation circuit. If the RTU fails to operate correctly, the output will be closed and the emergency circuit will take over control of the pumps.

3.6.3. General outputs

If not used for motor protection reset, outputs 2 and 4 can be reconfigured as general outputs. Each of the two outputs can then be configured so that it will be activated by a combination of the following signals:

- Power failure
- High level
- P1 faulty
- P1 blocked
- P2 faulty
- P2 blocked

3.6.4. Flygt default set points

This function resets the RTU to a known default status.

The initial status is:

- Language: English
- Control: Level sensor

·Measurement range: 1 metre and with appropriate starting and stopping levels.

- Extra functions: Shut off

4. Pump control functions

In addition to the parameters described in the previous chapter, a number of other set points can be specified. These and the related parameters are described below.

Note that the '**Yes**' option must first be selected in the **SHOW MORE MENUS** menu to gain access to these menus.

4.1. Manual/Auto control

Pump operation is in the automatic mode when the inputs P1 Auto and P2 Auto are active.

The automatic mode also requires the **P1 STATE** and **P2 STATE** menus to be set to Automatic.

1. Display the **PUMP CONTROL** menu.
2. Press the **OK** button to display the **P1 State menu**.
3. Press **OK**.
4. Select Auto and press the **OK** button.
5. Display the **P2 STATE menu**.
6. Press **OK**.
7. Select Auto and press the **OK** button.

The RTU can also control the manual mode of a pump. Select the function P1 Manual or P2 Manual in two of the functions.

1. Display the **I/O SETUP** menu, and press **OK**.
2. Advance to the **FUNCTION SELECT** menu.
3. Press the **OK** button.
4. Display **GENERAL INPUT FUNCTION 1** menu.
5. Press **OK**.
6. Select the required function and press the **OK** button.
7. For **GENERAL INPUT FUNCTION 2** menu, repeat steps 4 - 6.

General input 1-4 menus. Selection of the two manual functions is mandatory when the EX-mode is On, in which case the General inputs 3 and 4 are automatically assigned this function.

The pumps can be started from the central system by the remote control commands Start P1 and Start P2.

4.2. Blocking

When a pump is neither in the automatic or in the manual mode the state of the pump will be blocked. This state is indicated by the Pump blocked LED on the operator panel. In this state no attempt to will be made start the pump.

The pumps can be blocked in the program by setting the **P1 STATE** and **P2 STATE** menus to Blocked.

See "Manual/Auto control

A low level condition will temporarily block the pumps.

The pumps can be blocked externally by selecting the Blocking function in one of the General input functions 1-4. This affects all pumps in the station.

The pumps can be blocked from the central system through the remote control command Stop and block pumps. This affects all pumps in the station.

4.3. EX mode

The EX function should be enabled when the RTU is used in an EX classified environment.

The RTU blocks the pumps from starting when no liquid is detected in the sump. To enable the function, select **On** in the **EX MODE** menu.

1. Display the **GENERAL** menu and press the **OK** button.
2. Display the **EX MODE menu**.
3. Press **OK**.
4. Select **On** and press the **OK** button.

This also automatically assigns the functions P1 manual and P2 manual to the **General Input function** 3 and 4 respectively.

4.4. Power on delay

A power on delay of 10 seconds is applied when the power supply is restorded after power failure. During this time, the pumps are blocked and the pump blocked LEDs on the panel will show a flashing red light.

4.5. Alternation

The **ALTERNATION** menu specifies the pump operating sequence.

P1 primary	P1 will start on **Start level 1** and P2 on **Start level 2**.
P2 primary	P2 will start on **Start level 1** and P1 on **Start level 2**.
Start alternation	The pumps will start alternately.
Run hour alternation	P1 and P2 will alternate after the number of hours of operation entered in the **ALTERNATION** INTERVAL **menu**.

4.6. Start delay

The function prevents both pumps from starting simultaneously. The second pump will start 5 seconds after the first pump has started.

4.7. Minimum pause time

A minimum delay of 5-second is applied before a pump can be restarted after a stop.

4.8. Max. number of pumps

The **MAX. NO. OF PUMPS** menu can be used to limit the maximum number of pumps running at the same time.

1. Display the **MAX. NO. OF PUMPS** menu.
2. Press ***OK***.
3. Enter the maximum number of pumps that are allowed to run at the same time.
4. Press ***OK***.

4.9. Maintenance run

If the pump has not been started by the normal control system within the number of hours specified in the **AUTOSTART INT** (interval) menu, it will be started automatically by the APP 521. The pump will be run for the time specified in the **AUTO START TIME** menu.

1. Display the **AUTO START TIMEmenu**.
2. Press **OK**.
3. Set the required value (range 0 to 2 minutes) and press the **OK** button.

This function is disabled by entering 00:00 in the **AUTO START TIME** menu.

4.10. High level float - backup control

When the high level switch is activated, a backup function will start a pump. The pumps will run for the time specified in the **HIGH LEV RUN TIME** menu. Time counting starts when the high level signal goes passive.

1. Display the **HIGH LEV RUN TIME menu**.
2. Press **OK**.
3. Set the required value (range 0 to 10 minutes) and press the **OK** button.

4.11. Pump faults

Pump faults that prevents the pump from running are:

- High temperature.
- Motor protection tripped.

This is indicated by the Pump fault LED on the display panel.

Pump faults that temporarily stops the pump are:

- Max run time.

Pump faults that only initiate an alarm are:

- Feedback error.

4.12. High temperature

The high temperature input is normally closed (NC). If the thermal overload switch is not connect it must be jumpered.

A high temperature state prevents the pump from running. When the temperature reverts to normal, then the pump will again be allowed to run.

4.13. Motor protection tripped

The pump tripped input indicates to the RTU that the motor protection has tripped. The pump is prevented from starting.

When a motor protection trips and the automatic reset function is enabled in the **AUTOMATIC RESET** menu, the RTU will first wait for 3 minutes for the protection to cool and will then try to reset the motor protection.

Should the next pump cycle result in a new tipped condition no further attempts will be made and the pump fault will persist.

Tripped motor protection can be reset from the operator panel, by pressing the **Reset** button.

The motor protection can be reset from the central system by sending the Reset remote control command.

4.14. Max. run time

The maximum permissible pump running time can be limited to a preset value.

1. Display the **PUMP CONTROL** menu
2. Press the **OK** button
3. Display **the MAX. RUN TIME** menu.
4. Press **OK**.
5. Set the required value (0 to 50 minutes) and press the **OK** button.

The function can be disabled by entering **0** in the menu i.e. there is no limit for the maximum pump running time.

After the time has elapsed an alarm will be generated and the pump will be stopped.

The value set in the **MAX. RUN TIME** menu must exceed a pumping cycle. When estimating the length of a pumping cycle, also consider any additions made for the following functions:

- Stopping delay (when analogue control is used).
- Run time (when digital control is used and the Stop condition is Run on time).
- High level run time (backup control).

4.15. General purpose inputs

Four inputs are available for external functions, i.e. General-Purpose 1 input to General-Purpose 4 input.

The following functions can be selected:

- External alarm
- Personnel alarm
- Blocking
- Overflow sensor
- Low level
- Power failure
- Rain meter
- P1 Leakage
- P2 Leakage
- P1 Spare alarm
- P2 Spare alarm
- P1 Manual
- P2 Manual

4.15.1. General input functions 1 - 4

Select the required function in each of the General-Purpose menus.

1. Display the **FUNCTION SELECT** menu.
2. Press the **OK** button.
3. Display the **GENERAL INPUT FUNCTION 1** menu.
4. Press **OK**.
5. Select the required function and press the **OK** button.
6. For **GENERAL INPUT FUNCTION 2** menu to **GENERAL INPUT FUNCTION 4** menu, repeat step 3 - 5.

4.16. Pump feedback

The pump feedback input indicates to the RTU that the pump relay is activated. The signal is expected as a feedback to activating the pump relay.

In addition to the general alarm delay, the alarm is delayed by a fixed 5 second start-up delay.

A pump response error alarm will be generated.

5. Pump operating data

5.1. Running hours and numbers of starts

Pump operating information is displayed in the **Operating data** submenu. The following information is recorded:

- Running hours for P1 and P2 respectively.
- Number of starts for P1 and P2 respectively.

5.1.1. Resetting the operating data

To reset a stored value:

1. Display the **APPROPRIATE** menu.
2. Press the OK button. The text '**Reset value? No**' will be displayed.
3. Shift between '**No**' and '**Yes**' using the **Up** arrow or **Down** arrow button.
4. To set the value to zero, press the **OK** button while the '**Yes**' option is on. The message '**Value stored**' will be displayed.
5. To cancel, press the **ESC** button.
   Pressing the **OK** button while the "**No**" option is on will have the same effect.

5.2. Current

The pump current can be read in the **P1 CURRENT** and **P2 CURRENT** menus respectively. See also.

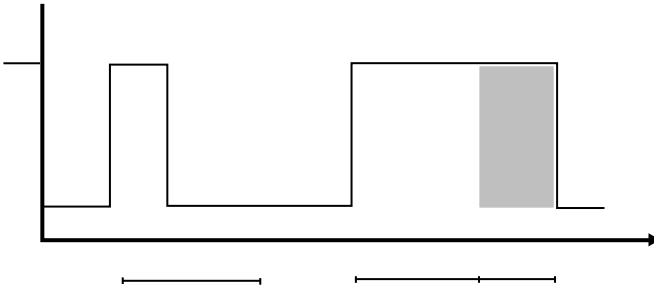
5.3. Level

In the analogue control mode, the actual level is shown in the **LEVEL** menu.

6. Alarms

6.1. General alarm delay

Alarms are delayed by the time set in the **GENERAL ALARM DELAY** menu.



A separate alarm delay is used for the Power failure alarm and the Low level alarm.

A power failure alarm can be delayed for a maximum of 2 minutes, provided that an external battery is connected and can supply the unit. The delay is set in the **POWFAIL ALARM DELAY** menu.

1. Display the **ALARM SETUP** menu and press OK.
2. Scroll to the menu for the **POWFAIL ALARM DELAY.**
3. Press **OK**.
4. Enter the time for the delay and press OK.
5. Repeat steps 2 to 4 for **AL. DELAY LOW LEVEL**.

6.2. Common alarm output

In the event of an alarm, the '**Common alarm**' output will be activated. The output can be connected to various types of audible or visual devices (lamps, sirens and the like) to indicate a fault condition in the unit.

1. Display the **COMMON ALARM** menu.
2. Switch between steady and flashing indication.

3. Make your choice and press the **OK** button

1. Display the **COM. ALARM ACTIV**E menu.
2. Select the alarms that are to activate the output.
3. Display the **COM. ALARM ACTIVE 2** menu.
4. Select the alarms that are to activate the output.

To deactivate the common alarm output:

Press the **Reset** button.

The alarm output will be activated again when a new alarm has occurred

6.3. Alarm logging

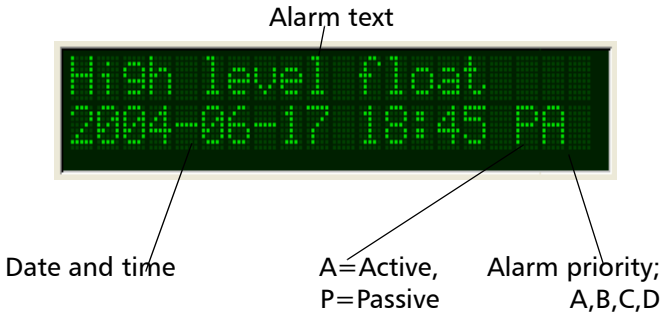
Alarms are recorded in the alarm log. The last 100 alarms are saved.

6.3.1. Viewing alarms

The number of active alarms is displayed in the **ALARM LOG** menu.

Press the **OK** button to open the log

The first alarm will be displayed.



Example: High level float alarm

- Browse the log by repeatedly pressing the **Down** button.
- To move instead directly to the latest alarm, press the **Up** button.

1. Display the **ALARM LOG** menu.
2. Press the **OK b**utton to open the log. The first alarm will be displayed in the menu window.
3. Press the **Up/down** button to scroll to the required alarm.
4. Press the **OK** button.
   A "Delete alarm?" message will appear ***and Current alarm*** will be displayed.

5. Choose between "Current alarm" and "All alarms" by pressing the **Down** button and then press the **OK** button.
6. The alarm will be cleared and the text "Log cleared" message will be displayed.

To exit the log without changing the log:

Press the **ESC** button.

Active alarms are not removed from the log.

6.4. Alarm handling

The **Alarm handling** menu is used to determine whether the RTU is to send alarms to the central system or the SMS.

Local	No alarms are sent.
Remote	Alarms are sent.
Clear	The alarm buffer is cleared and the Alarm handling mode then is set to Remote.

If the sending fails, e.g. if the recipient is busy or does not reply, the RTU will wait for 1 minute before the next attempt. Following each successive failure the waiting time will be increase by 1 minute until 10 attempts have failed. The RTU will then wait for 3 hours before then dialing sequence is recommenced.

6.4.1. Alarm priority

The alarm priority of an alarm determines what happens with the alarm.

A	The alarm is sent to the central system and then on to paging.
B	The alarm is sent to the central system.
C	The alarm is local in the RTU.
D	The alarm is sent to the central system and then on to paging according the D-alarm time frame of the central system. If SMS is used the alarm is sent according the D-alarm time frame in the RTU.
F	The alarm is not recorded.
H	The alarm is recorded in a separate event log, if available. This is not available in the RTU.

6.4.2. Times for D-alarms

D-alarms are distributed to paging only during the period between **D-alarm start time** and **D-alarm end time**. If the alarm occurs at any other time, the central system/RTU will wait until the D-alarm time frame begins and will then send the alarm.

1. Display the **D-ALARM START TIME** menu.
2. Press OK.
3. Enter the times when **D-alarms** should begin to be sent to the central system or the SMS.
4. Press the **OK** button when the cursor is in the last position.
5. Display the **D-ALARM END TIME** menu.
6. Press OK.
7. Enter the time when D-alarms should cease to be sent to the central system or the SMS.
8. Press the **OK** button when the cursor is in the last position.

To inhibit the D alarm function, enter 0 in both menus. A D alarm will be treated as an A alarm.

6.4.3. Customized alarm texts

The alarm text of external alarms can be changed in the Alarm text 1-7 menus. Extended ASCII characters can be used e.g. öøé.

The texts are used in the alarm log and in SMS. If the first character of the text is left blank, the standard alarm text will be used instead.

1. Display the **ALARM TEXT MENU.**
2. Press the **OK** button to display **ALARM TEXT INPUT** 1.
3. Press **OK**.
4. Enter the new text and press the **OK** button.
5. Repeat step 2-3 for every new text for **ALARM TEXT INPUT** 1 - 7.

6.4.4. Alarm code filter

The code of the external alarms can be changed in the Alarm code input 1-7 menus. Changing the alarm code enables a general alarm to become a specific alarm with a clearly defined alarm text, appropriate to a particular station.

The alarm code filters are normally changed from the central system.

1. Display the **ALARM CODE FILTER** menu.
2. Press the **OK** button to display **ALARM CODE INPUT** 1.
3. Press OK.
4. Enter a new code and press the **OK** button.
5. Repeat step 2-4 for every new code for **ALARM CODE INPUT** 1 - 7.

:

6.4.5. SMS

The RTU can send alarms directly to a mobile phone using SMS. The information given in the SMS is

Station No — Date and time — Alarm text

1 - Kristianstadvägen 2004-06-17 21:45 A Hög nivå (A)

Station name — Alarm priority

A=Active
P=Passive

Alarms
The APP 521 generates alarms in various situations as part of pump monitoring

Alarm Code	Default priority	Local text	Central System Text	Description
1	A	High level	High level	High level in pump sump. Alarm from the level sensor
2	C	Low level	Low level	High level in pump sump. Alarm from the level sensor
3	B	Mains error	Mains error	The main power has been disrupted or the phase sequence is incorrect or one phase is missing
4	A	High level float	High level float	The level in the sump reaches the high level switch. The pumps will be started
5	A	Pers. alarm	Personal alarm	Personal alarm warning time has run out without reset. Personnel in danger!
11	B	Tripped motor P1	Tripped motor protector P1	The Pump 1 has a tripped motor protection. The pump is blocked by this alarm
12	B	Tripped motor P2	Tripped motor protector P2	The Pump 2 has a tripped motor protection. The pump is blocked by this alarm
15	B	High current P1	High current P1	High current pump 1. Alarm from the analogue current measurement
16	C	Low current P1	Low current P1	Low current pump 1. Alarm from the analogue current measurement
17	B	High current P2	High current P2	High current pump 2. Alarm from the analogue current measurement
18	C	Low current P2	Low current P2	Low current pump 2. Alarm from the analogue current measurement
27	H	Setpoint changed	Setpoint changed	At least one menu has been changed on the local display. The alarm revertes when new set points are sent to the RTU
30	C	No response P1	No response P1	There is no response signal from pump 1. The pump has probably not started despite activation of the power relay
31	C	No response P2	No response P2	There is no response signal from pump 2. The pump has probably not started despite activation of the power relay
34	A	Overflow	Overflow	Overflowing. The station is now overflowing
35	A	High temp. P1	High temperature P1	High temperature in pump 1
36	A	High temp. P2	High temperature P2	High temperature in pump 2
40	C	Low level float	Low level float	Low level float. The pumps will be stopped
41	C	Inval.setpoints	Invalid setpoints	The level setpoints are incorrect. The specified setpoints for Start, Stop or High level is either outside the calibration range or they are mutually not corresponding, i.e. the high level setpoint is lower than the start level setpoint
54	C	Leakage P1	Leakage P1	Water in oil. Alarm from pump 1
55	C	Leakage P2	Leakage P2	Water in oil. Alarm from pump 2

Alarm Code	Default priority	Local text	Central System Text	Description
81	C	Alarm input 01	Alarm digital input 01	Alarm from digital input 1. The alarm is user defined
82	C	Alarm input 2	Alarm digital input 2	Alarm from digital input 2. The alarm is user defined
83	C	Alarm input 3	Alarm digital input 3	Alarm from digital input 3. The alarm is user defined
84	C	Alarm input 4	Alarm digital input 4	Alarm from digital input 4. The alarm is user defined
85	C	Alarm input 5	Alarm digital input 5	Alarm from digital input 5. The alarm is user defined
86	C	Alarm input 6	Alarm digital input 6	Alarm from digital input 6. The alarm is user defined
87	C	Alarm input 7	Alarm digital input 7	Alarm from digital input 7. The alarm is user defined
8214	B	Low 24V Supply	Low 24V external supply	Low 24V supply
8460	C	P1 Spare alarm	P1 Spare alarm	P1 spare alarm
8461	C	P2 Spare alarm	P2 Spare alarm	P2 spare alarm
8484	B	P1 max run time	P1 max run time	The pump 1 has exceeded the maximum allowed run time. The pump is blocked by this alarm. See also the Max run time set-point
8485	B	P2 max run time	P2 max run time	The pump 2 has exceeded the maximum allowed run time. See also the Max run time set-point
8505	C	Sensor Fault	Sensor Fault	An error in the analogue sensor has been detected. The measured level is outside the sensor range
8538	B	I/O-mod not resp	I/O module(s) not responding	Communication problem with I/O module. The I/O module is not responding
8539	C	Wrong I/O module	Wrong type of I/O module	Communication problems with I/O units. Wrong unit type
8630	B	Testcall !	Testcall !	A test alarm is sent in order to verify that the RTU and its communication is working properly. The alarm is sent at a regular interval, which is configurable
8652	C	High rain 5 min	High rainfall 5 min	The RTU has calculated a rainfall higher than the rain alarm limit for 5 minutes
8653	C	High rain 24 h	High rainfall 24 h	The RTU has calculated a rainfall higher than the rain alarm limit for 24 hours

7. Communication

7.1. Systems

7.1.1. Direct communication with the central system

In this system the RTU communicates directly with the central system.

A modem, a radio or a signal cable is used for the transmission of information between the units in the system.

Either the factory settings or the first user profile of the modem (profile 0) can be used. In the first case no special configuration of the modem is required but in the second case the user profile has to be configured prior to use with the RTU.

7.1.2. Communication via MTC-COM

In this system the RTU communicates with the central system, via the communication unit, MTC-COM.

A modem, a radio or a signal cable is used for the transmission of information between the units in the system.

Prior to use with the RTU the first user profile of the modem (profile 0) has to be configured.

Note! The factory settings of the modem cannot be used in this case.

7.1.3. Modems

Communication is possible using:

- GSM-modem.
- Hayes-modem.
- Radio in transparent mode.

The modem can either use factory settings or user profile 0, which must then be pre-configured.

7.2. Connection

7.2.1. Connection to a modem or radio

Connect a straight serial cable from the modem/radio to the RS232 connector on the COM1.

Connect the modem/radio to its own supply.

7.2.2. Connection to a PC using fixed line

Connect a straight serial null-modem cable from the PC to the RS232 connector on the COM1.

7.3. Configuration

7.3.1. Fixed line FDX

Can be used for:

- Communication directly to a PC.
- Communication using a fix line modem.
- Communication using radio.

Menu	Values	Description
Communication COM1	RS232 FDX	Normally FDX can be used if the central system has not specially been set-up to use HDX.
Protocol COM1	AquaCom Fix	
Speed COM1	2400-57600 bps	Set this value to the same as the port baudrate in the central system.
Max buffer size	80-4000	Normally 2000 is used. If your radio has a limited buffer or there are disturbances decrease this value. e.g. 500.

7.3.2. Fixed line HDX

Can be used for:

- Communication directly to a PC.
- Communication using a fix line modem.
- Communication using radio.

Menu	Values	Description
Communication COM1	RS232 HDX	Will work with normal settings in the central system.
Protocol COM1	AquaCom Fix	
RTS delay COM1	25-1000 ms	Low delay means faster communication. Use higher value if required by the radio. I.e. if there is problems with the communication.
Speed COM1	2400-57600 bps	Set this value to the same as the port baudrate in the central system.
Max buffer size	80-4000	Normally 2000 is used. If your radio has a limited buffer or there are disturbances decrease this value. e.g. 500.

7.3.3. Dialed up modem

Can be used for:

- Communication using a Hayes compatible telephone modem.
- Communication using a GSM modem.

Note: Please observe the limitation in combinations of modems and their configuration strings.

Menu	Values	Description
Communication COM1	Hayes modem GSM/Hayes predef.	Select Hayes modem when using TD33 for communication directly to the central system. In all other cases configure the modem using a PC and select GSM/ Hayes predefined. See appendix on preconfiguration of modems. Select this option if an MTC-COM is included in the system.
Protocol COM1	AquaCom dialled	
Speed COM1	2400-57600 bps	If your modem supports autobauding, set this as high as possible to get the best communication performances. Otherwise set this value to the same as the value used in the preconfiguration of the modem.
Telephone no. CS/SMS		Enter the telephone number to the Central system or MTC-COM.

7.3.4. GSM modem

Can be used for:

- Communication using a GSM modem.

Note: Please observe the limitation in combinations of modems and their configuration strings.

Menu	Values	Description
Communication COM1	GSM/Hayes predef.	Configure the modem using a PC and select GSM/Hayes predefined. See appendix on pre-configuration of modems.
Protocol COM1	AquaCom dialled	
Speed COM1	2400-57600 bps	If your modem supports autobauding, set this as high as possible to get the best communication performances. Otherwise set this value to the same as the value used in the pre-configuration of the modem.
Telephone no. CS/SMS		Enter the telephone number to the SMS recipient. I.e. the personnel.

7.3.5. GSM modem and SMS

Can be used for:

- Communication using a GSM modem or a telephone modem.

Note: Please observe the limitation in combinations of modems and their configuration strings.

Menu	Values	Description
Communication COM1	GSM/Hayes predef.	Configure the modem using a PC and select GSM/Hayes predefined. See appendix on pre-configuration of modems.
Protocol COM1	AquaCom/SMS	
Speed COM1	2400-57600 bps	If your modem supports autobauding, set this as high as possible to get the best communication performances. Otherwise set this value to the same as the value used in the pre-configuration of the modem.
Telephone no. CS/SMS		Enter the telephone number to the SMS recipient. I.e. the personnel.
Station name		Enter a name that will be sent in the SMS alarm message.

8. Fault tracing

8.1. Status of inputs

The MIO501 has 16 digital inputs plus 2 internal inputs for supervising the power supply.

The status of the signals can be viewed in the **STATUS INPUTS** menu (0 = non-active, 1 = active).

8.2. Inversion of inputs

The digital input signals can be inverted to change the operating mode from closing to opening, or vice versa. 0 indicates no inversion. This is the default state.

8.3. Diagnostic functions

The diagnostic menu is used to test the hardware. When it is activated the normal pump control operation is deactivated.

Select the desired diagnostic function:

Menu value	Function	Result
Off	None	The RTU is in normal operation.
10	Digital inputs	The states of the digital inputs are displayed e.g. 1001100100000000
11	LED output Common alarm output	Flashes at 1 second interval.
20	Analogue input	Shows the raw input values (0-16383.
24	P1 current input	Shows the raw input values (0-16383). This starts P1.
25	P2 current input	Shows the raw input values (0-16383). This starts P2.

After 10 minutes the unit will automatically revert to normal operation.

9. Central system

9.1. Status

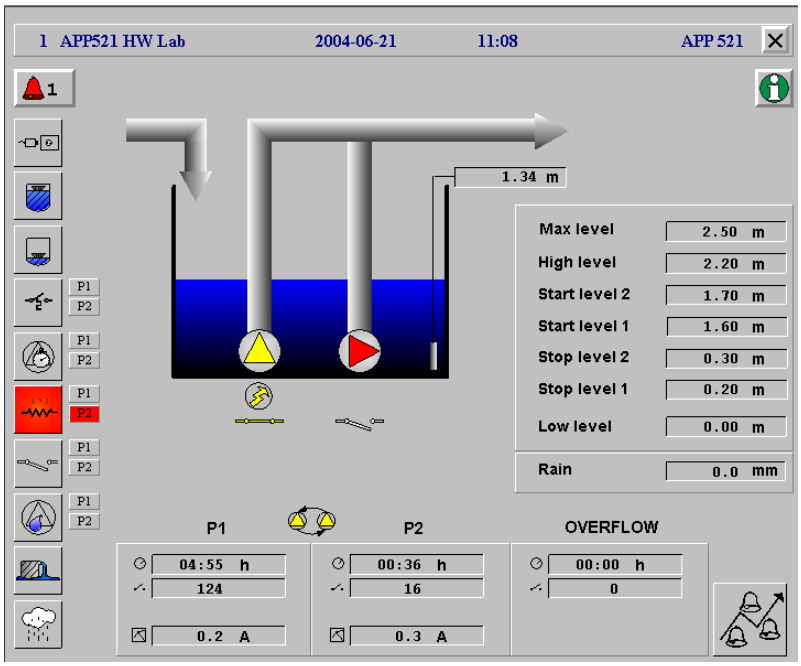
The status picture shows the momentary status of the station together with daily operating data along with a list of active alarms.

P1 running
P1 remote ctrl
P1 relay On

P1 Fault

P2 relay Off

Active alarms
Power failure
High level
Low level
Tripped
Max runtime
High temp.
Response err.
Leakage
Overflow
Rain alarm



RTU info

Level
Sensor range
High level
Start levels
Stop levels
Low level
Rain

Alternation

P1 run time
P1 starts
P1 current

P2 run time
P2 starts
P2 current

Overflow time
Overflow count

Remote alarming

9.1.1. Remote control

As part of the status the RTU can be remotely controlled.

Object	Description
P1	F1 = Start pump 1 F2 = Stop and block pumps F3 = Return control to automatic F4 = Reset unit
P2	F1 = Start pump 2 F2 = Stop and block pumps F3 = Return control to automatic F4 = Reset unit

The RTU reverts to the automatic mode within 30 seconds after the modem has hung up.

9.2. Set points

9.2.1. Set point values

Set point values can be fetched and sent in random order.

9.2.2. Alarm code filter

Alarm code filter can be fetched and sent in random order.

Fetching alarm code filter requires at least AquaView 1.23.01.

9.2.3. Alarm priority

Alarm priorities can be fetched and sent in random order.

Fetching alarm priorities requires at least AquaView 1.23.01.

9.3. Report

The report data consists of daily data divided into 4 segments.

- 00:00 - 06:00
- 00:06 - 09:00
- 09:00 - 16:00
- 16:00 - 24:00

The RTU stores report data for 31 days.

Report

Text1	Text2	Text3	Description
Run time	P1	h:min	Pump 1 running time
Run time	P2	h:min	Pump 2 running time
Overflow	time	h:min	Overflow time
Starts	P1		Number of pump 1 starts
Starts	P2		Number of pump 2 starts
Rain		mm	Rain
Overflow	count		Number of overflows

9.4. Trend

The trend data consist of historical data with selectable sample resolution:

- 1-minute average
- 5-minute average

Enter the preferred resolution in the Trend resolution menu.

The RTU stores trend data for 7 days.

Trend

Text1	Text2	Text3	Description
Level		m	Level
Current	P1	A	P1 current. (Maximum value in period)
Current	P2	A	P2 current. (Maximum value in period)
Rain		mm	Rain 5 minute running average

Select the same trend resolution in the RTU settings as in the AquaView.

10. Appendix A: List of menu

No	Menu Name	Specification	Description
1	Alarm log	Writable	Alarm log.
2_	Level m	Read only	Level indication.
2_1	Start Level 1 m	Writable Interval -99.99 To 99.99 Central System Text Start Level 1 (m)	Start level for first pump.
2_2	Stop Level 1 m	Writable Interval -99.99 To 99.99 Central System Text Stop Level 1 (m)	Stop level for first pump.
2_3	Start Level 2 m	Writable Interval -99.99 To 99.99 Central System Text Start Level 2 (m)	Start level for second pump.
2_4	Stop Level 2 m	Writable Interval -99.99 To 99.99 Central System Text Stop Level 2 (m)	Stop level for second pump.
2_5	High Level m	Writable Interval -99.99 To 99.99 Central System Text High Level (m)	High level alarm limit.
2_6	Low Level m	Writable Interval -99.99 To 99.99 Central System Text Low Level (m)	Low level alarm limit. 0 - disables the funtion.
2_7	Random start range m	Writable Interval 0.00 To 99.99 Central System Text Random start range (m)	Random start range
2_8	Sensor range m	Writable Interval 0.00 To 20.00	Sensor range.
2_9	Sensor calibration m	Writable Interval -20.00 To 20.00	Sensor calibration offset.
3_	P1 current A	Read only Interval 0.0 To 999.9	Measured current for first pump.
3_1	P1 high current A	Writable Interval 0.0 To 999.9 Central System Text P1 high current (A)	High current alarm limit for first pump.
3_2	P1 low current A	Writable Interval 0.0 To 999.9 Central System Text P1 low current (A)	Low current alarm limit for first pump.
3_3	P1 max current A	Writable Interval 0 To 999	Current transformer range for first pump.
4_	P2 Current A	Read only Interval 0.0 To 999.9	Measured current for second pump.

No	Menu Name	Specification	Description
4_1	P2 high current A	Writable Interval 0.0 To 999.9 Central System Text P2 high current (A)	High current alarm limit for second pump.
4_2	P2 low current A	Writable Interval 0.0 To 999.9 Central System Text P2 low current (A)	Low current alarm limit for second pump.
4_3	P2 max current A	Writable Interval 0 To 999	Current transformer range for second pump.
5_	Operating data	Read only	Menu group for operating data
5_1	P1 start counter	Writable	Number of start for first pump.
5_2	P1 run hour h:min	Writable	Run hour for first pump.
5_3	P2 start counter	Writable	Number of starts for second pump.
5_4	P2 run hour h:min	Writable	Run hour for second pump.
6_	Overflow	Read only	Menu group for overflow
6_1	Overflow count	Writable	Number of overflows.
6_2	Overflow time h:min	Writable	Overflow time.
7_	Rain mm	Read only Interval 0 To 0	Rain daily value.
7_1	Rain alarm 5min mm/5min	Writable Interval 0.0 To 99.9	Rain limit for 5 minute period.
7_2	Rain alarm 24h mm/24h	Writable Interval 0.0 To 999.9	Rain alarm limit for 24 hours.
7_3	Rain scale mm/pulse	Writable Interval 0.0 To 99.9	Rain meter scale factor.
8_	Pump control	Read only	Menu group for pump control
8_1	P1 state	Writable Alternative 0 = Auto 1 = Blocked	Program controlled automatic or blocked state for first pump.
8_2	P2 State	Writable Alternative 0 = Auto 1 = Blocked	Program controlled automatic or blocked state for second pump.
8_3	Stop delay range m	Writable Interval 0.00 To 2.50 Central System Text Stop delay range (m)	Specifies an additional height, below the Stop level, to be pumped down. The RTU calculates the stop delay time required to lower this height. 0 - disables the function
8_4	Stop delay time min:s	Writable Interval 00:00 To 10:00 Central System Text Stop delay time (min:s)	Delays stopping of the pump by the preset time. Applicable to stop level 1 only. NOTE: This set point should not be entered if the calculated stop delay function is activated.

No	Menu Name	Specification	Description
8_5	Alternation	Writable Alternative 0 = P1 primary 1 = P2 primary 2 = Start alt. 3 = Run hour alt. Central System Text Alternation	The Alternation menu specifies the pump operating sequence. 0 - P1 primary 1 - P2 primary 2 - Start alternation 3 - Run hour alternation
8_6	Alternation interval h	Writable Interval 1 To 200 Central System Text Hour alternation time (h)	Enter the interval at which the pumps shall alternate. Applicable only when run hour alternation is selected.
8_7	Max. no. run. pumps	Writable Alternative 0 = 1 1 = 2 Central System Text Max. number of running pumps	Specifies maximum number of pumps running at the same time. 0 - 1 pump 1 - 2 pumps
8_8	Auto start interval h	Writable Interval 1 To 200 Central System Text Auto start interval (h)	If a pump has not been started within the set interval, the function will start the pump for a maintenance run, The running time is set in the Auto start time menu.
8_9	Auto start time min:s	Writable Interval 00:00 To 02:00 Central System Text Auto start time (min:s)	The running time when started by the auto start function. 0 - disables the function.
8_10	High level run time min:s	Writable Interval 00:00 To 10:00 Central System Text High Level run time (min:s)	Backup control activated when there is a level sensor failure. The high level switch activates the start of a pump (or two), which will then run for the period set in this menu.
8_11	Max. run time min:s	Writable Interval 00:00 To 50:00 Central System Text Max. run time (min:s)	The maximum time the pumps are allowed to run continuously. 0 - disables the function.
9_	Alarm setup	Read only	Menu group for alarm
9_1	General alarm delay min:s	Writable Interval 00:00 To 02:00 Central System Text General alarm delay (min:s)	Delays the recording of an alarm. Used for all alarms except power failure alarm and low level.
9_2	Pow.fail alarm delay min:s	Writable Interval 00:00 To 02:00 Central System Text Power failure alarm delay (min:s)	The delay of a Power failure alarm before it is recorded.
9_3	Low lev. alarm delay min:s	Writable Interval 00:00 To 02:00 Central System Text Low level alarm delay (min:s)	The delay of a Low level alarm before it is recorded.
9_4	Work time min	Writable Interval 0 To 240	Work time before an acknowledge is required from the personnel.
9_5	Warning time min	Writable Interval 1 To 15	Warning time, during which an acknowledge from personnel is requested, before the personnel alarm is sent.

No	Menu Name	Specification	Description
9_6	Transmit alarm	Writable Alternative 0 = Local 1 = Remote 2 = Clear Central System Text Transmit alarm	Alarm transmission. 0 - Local. Alarms are not transmitted. 1 - Remote. Alarms are transmitted to the Central system/SMS receiver. 2 - Clear. Clears the alarm buffer and changes to Remote.
9_7	Auto remote mode min:s	Writable Interval 00:00 To 50:00	The time after which the controller will revert to remote alarming mode. 0 - disables the function.
9_8	Alarm priority 1	Writable Alternative 1 = Mains error 2 = High level float 3 = High level 4 = Sensor Fault 5 = Invalid setpoints 6 = High temp. P1 7 = High temp. P2 8 = Tripped motor P1 9 = Tripped motor P2 10 = P1 max run time 11 = P2 max run time 12 = High current P1 13 = High current P2 14 = Low current P1 15 = Low current P2 16 = No response P1 17 = No response P2 18 = Leakage P1 19 = Leakage P2 20 = Pers. Alarm	Alarm priorities.
9_9	Alarm priority 2	Writable Alternative 1 = Overflow 2 = Low level float 3 = Low level 4 = Alarm input 1 5 = Alarm input 2 6 = Alarm input 3 7 = Alarm input 4 8 = Alarm input 5 9 = Alarm input 6 10 = Alarm input 7 11 = High rainfall 5 min 12 = High rainfall 24 h 13 = I/O-mod not resp. 14 = Wrong I/O module 15 = Set-point changed 16 = Test call! 17 = Low 24V Supply 18 = P1 Spare alarm 19 = P2 Spare alarm	Alarm priorities. Continuation.
9_10_	D-alarm start time	Writable Interval 00:00 To 00:01	The start time for dialling out alarms with priority D.
9_11	D-alarm end time	Writable Interval 00:00 To 00:01	The stop time for dialing out alarms with priority D.

No	Menu Name	Specification	Description
9_12_	Alarm texts	Read only	Menu group for alarm texts
9_12_1	Alarm text input 1	Writable Central System Text Alarm text input 1	Alarm text to use for general input 1.
9_12_2	Alarm text input 2	Writable Central System Text Alarm text input 2	Alarm text to use for general input 2.
9_12_3	Alarm text input 3	Writable Central System Text Alarm text input 3	Alarm text to use for general input 3.
9_12_4	Alarm text input 4	Writable Central System Text Alarm text input 4	Alarm text to use for general input 4.
9_12_5	Alarm text input 5	Writable Central System Text Alarm text input 5	Alarm text to use for general input 5.
9_12_6	Alarm text input 6	Writable Central System Text Alarm text input 6	Alarm text to use for general input 6.
9_12_7	Alarm text input 7	Writable Central System Text Alarm text input 7	Alarm text to use for general input 7.
9_13_	Alarm code filter	Read only	Menu group for alarm code filter
9_13_1	Alarm code input 1	Writable Interval 1 To 9999	Alternative alarm code to use for general input 1
9_13_2	Alarm code input 2	Writable Interval 1 To 9999	Alternative alarm code to use for general input 2
9_13_3	Alarm code input 3	Writable Interval 1 To 9999	Alternative alarm code to use for general input 3
9_13_4	Alarm code input 4	Writable Interval 1 To 9999	Alternative alarm code to use for general input 4
9_13_5	Alarm code input 5	Writable Interval 1 To 9999	Alternative alarm code to use for general input 5
9_13_6	Alarm code input 6	Writable Interval 1 To 9999	Alternative alarm code to use for general input 6
9_13_7	Alarm code input 7	Writable Interval 1 To 9999	Alternative alarm code to use for general input 7
9_14_	Test alarm	Read only	Menu group for test alarm
9_14_1	Test alarm interval days	Writable Interval 0 To 99	Test alarm interval. How often the test alarm shall be sent.
9_14_2	Test alarm time	Writable Interval 00:00 To 23:59	Test alarm time. The time of the day, at which the test alarm is sent.
9_14_3	Test alarm state	Writable Alternative 0 = Off 1 = On	Manual activation of test alarm. Also reflects the current state of the test alarm.
10_	Communication	Read only	Menu group for communication with the Central system/SMS.
10_1	Telephone CS/SMS	Writable Central System Text Telephone number to Central system / SMS	Telephone number to central system or SMS receiver. T=Tone dial. The telephone number is required for alarm handling to the central system or SMS receiver.

No	Menu Name	Specification	Description
10_2	Station number / id	Writable Interval 0 To 1	The unique number of the station within the system.
10_3	Station name	Writable Central System Text Station name	Enter the station name. This name will be used in SMS calls to a GSM telephone.
10_4	Communication COM1	Writable Alternative 0 = None 1 = Hayes modem 2 = GSM/Hayes predefined 3 = RS232 HDX 4 = RS232 FDX 5 = User modem	Type of communication to use for the communication with the Central System/SMS.
10_5	Modem init 1	Writable	Initialization string for the modem. (part 1) Applies only when 'User modem' is selected as communication.
10_6	Modem init 2	Writable	Initialization string for the modem. (part 2) Applies only when 'User modem' is selected as communication.
10_7	Speed COM1 bps	Writable Alternative 0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200 5 = 38400 6 = 57600	Speed to use for the communication with the Central System.
10_8	Protocol COM1	Writable Alternative 0 = AquaCom fixed 1 = AquaCom dialled 2 = AquaCom/SMS	Choice of transmission protocol to use for the communication with the Central System/SMS.
10_9	RTS delay COM1 ms	Writable Interval 25 To 1000	Delay for the RTS signal (request to send) in the communication with the Central System. Only in choice of RS 232 HDX.
10_10	Max buffer size bytes	Writable Interval 80 To 4000	Limits the data size when collecting trend.
11_	General	Read only	Menu group for general set-points
11_1	Date and time	Writable	Setting of date and time.
11_2	Control mode	Writable Alternative 0 = Digital 1 = Analogue	Selects if an analogue sensor or level switches are used for starting and stopping the pumps. Also referred to as analogue and digital mode.
11_3	Stop condition	Writable Alternative 0 = Run on time 1 = Stoplevel switch	Selects if a stop level switch is present or the pump is stopped after a time. Applies to digital mode only.
11_4	Digital run time min:s	Writable Interval 00:00 To 10:00 Central System Text Digital run time (min:s)	The pump running time when configured to Run on time, i.e. no stop level switch is used. Applicable to digital mode only.

No	Menu Name	Specification	Description
11_5	EX mode	Writable Alternative 0 = Off 1 = On	When EX-mode is on, the pumps are not allowed to start unless water can be detected in the sump. The function is used primarily in explosive environment
11_6	Auto reset	Writable Alternative 0 = No 1 = Yes Central System Text Tripped auto reset	Automatic reset of the motor protection in the case of an overcurrent failure. 0 - No. Inactivated function. The RTU blocks the pump. 1 - Yes. Activated function. The RTU will make a second attempt to start the pump.
11_7	Trend resolution min	Writable Interval 1 To 60	Trend resolution The granuality with which the trend data is stored and transmitted to the Central System. 1 minute or 5 minute periods.
11_8	System version	Read only	The RTU system version. Please have this number ready when calling Flygt support.
11_9	APP 521 version	Read only	The RTU program version. Please have this number ready when calling Flygt support.
11_10	Program mode	Writable Alternative 0 = Run 1 = Remote COM1	Run - The RTU is in normal operation controlling the pumps. Remote - The controller is waiting for a remote connection to be established, in order to perform some management activity. E.g. loading a new applicatin program.
11_11	New password	Writable	Activates the service password, which prevents unauthorized access to service menues. The password is disable by the value 0000.
12_	I/O setup	Read only	Menu group for I/O setup

No	Menu Name	Specification	Description
12_1	Status inputs	Read only Alternative 1 = 24V fail 2 = 230V fail 3 = P1 high temperature 4 = P1 tripped 5 = P1 response 6 = P1 auto 7 = P2 high temperature 8 = P2 tripped 9 = P2 response 10 = P2 auto 11 = Stop level 12 = Start level 1 13 = Start level 2 14 = High level 15 = General input 1 16 = General input 2 17 = General input 3 18 = General input 4	Status of the digital inputs.
12_2	Invert inputs	Writable Alternative 1 = 24V fail 2 = 230V fail 3 = P1 high temperature 4 = P1 tripped 5 = P1 response 6 = P1 auto 7 = P2 high temperature 8 = P2 tripped 9 = P2 response 10 = P2 auto 11 = Stop level 12 = Start level 1 13 = Start level 2 14 = High level 15 = General input 1 16 = General input 2 17 = General input 3 18 = General input 4	Inverts an input from being NO (normally open) to NC (normally closed). 0 - not inverted 1 - inverted
12_3	Common alarm	Read only	Menu group for common alarm output
12_3_1	Common alarm	Writable Alternative 1 = Continuous 2 = Intermittent	Type of common alarm output. Continuous or pulsating.

No	Menu Name	Specification	Description
12_3_2	Com. alarm activ. 1	Writable Alternative 1 = Mains error 2 = High level float 3 = High level 4 = Sensor Fault 5 = Invalid setpoints 6 = High temp. P1 7 = High temp. P2 8 = Tripped motor P1 9 = Tripped motor P2 10 = P1 max run time 11 = P2 max run time 12 = High current P1 13 = High current P2 14 = Low current P1 15 = Low current P2 16 = No response P1 17 = No response P2 18 = Leakage P1 19 = Leakage P2 20 = Pers. Alarm	Selects which alarms that activates the common alarm output. (part 1)
12_3_3	Com. alarm activ. 2	Writable Alternative 1 = Overflow 2 = Low level float 3 = Low level 4 = Alarm input 1 5 = Alarm input 2 6 = Alarm input 3 7 = Alarm input 4 8 = Alarm input 5 9 = Alarm input 6 10 = Alarm input 7 11 = High rainfall 5 min 12 = High rainfall 24 h 13 = I/O-mod not resp. 14 = Wrong I/O module 15 = Set-point changed 16 = Test call! 17 = Low 24V Supply 18 = P1 Spare alarm 19 = P2 Spare alarm	Selects which alarms that activates the common alarm output. (part 2)
12_4_	Function select	Read only	Meny group for general inputs

No	Menu Name	Specification	Description
12_4_1	Function gen.input 1	Writable Alternative 0 = None 1 = P1 warning 2 = P2 warning 3 = Power failure 4 = External alarm 5 = Blocking 6 = Personnel 7 = Overflow 8 = Low level 9 = P1 hand 10 = P2 hand 11 = Rain meter 12 = P1 Spare alarm 13 = P2 Spare alarm	Select function for general input 1.
12_4_2	Function gen.input 2	Writable Alternative 0 = None 1 = P1 warning 2 = P2 warning 3 = Power failure 4 = External alarm 5 = Blocking 6 = Personnel 7 = Overflow 8 = Low level 9 = P1 hand 10 = P2 hand 11 = Rain meter 12 = P1 Spare alarm 13 = P2 Spare alarm	Select function for general input 2.
12_4_3	Function gen.input 3	Writable Alternative 0 = None 1 = P1 warning 2 = P2 warning 3 = Power failure 4 = External alarm 5 = Blocking 6 = Personnel 7 = Overflow 8 = Low level 9 = P1 hand 10 = P2 hand 11 = Rain meter 12 = P1 Spare alarm 13 = P2 Spare alarm	Select function for general input 3.

No	Menu Name	Specification	Description
12_4_4	Function gen.input 4	Writable Alternative 0 = None 1 = P1 warning 2 = P2 warning 3 = Power failure 4 = External alarm 5 = Blocking 6 = Personnel 7 = Overflow 8 = Low level 9 = P1 hand 10 = P2 hand 11 = Rain meter 12 = P1 Spare alarm 13 = P2 Spare alarm	Select function for general input 4.
12_5_	I/O-module	Read only	Menu group for I/O-module
12_5_1	Base IP address	Writable	Base IP address for the RTU and the I/O module. 2 consecutive addresses are required. The first address is used by the RTU. The second address is used by the I/O-module and does not have to be entered.
12_5_2	I/O-mod. MAC address	Writable	The MAC address of the I/O-module
12_5_3	IP timeout	Writable	The timeout for the IP communication with the I/O module.
12_5_4	I/O module type	Read only	Type of I/O-module.
12_5_5	I/O module version	Read only	I/O-module versionon. The value is fetch from the I/O module
12_6_	Outputs	Read only	Menugroup for Outputs
12_6_1	Function output 2&4	Writable Alternative 0 = Motorprotect. reset 1 = General output	Select if the outputs is to be used as motor protection reset or general purpose outputs.
12_6_2	Output 2 config.	Writable Alternative 1 = Power failure 2 = High level 3 = P1 failure 4 = P1 blocked 5 = P2 failure 6 = P2 blocked	Select which signals that shall activate the output 2. Applies only if general purpose outputs have been selected.
12_6_3	Output 4 config.	Writable Alternative 1 = Power failure 2 = High level 3 = P1 failure 4 = P1 blocked 5 = P2 failure 6 = P2 blocked	Select which signals that shall activate the output 4. Applies only if general purpose outputs have been selected.
12_7	Diagnostic program	Writable Alternative 1 = Off 2 = 1-39	Diagnostic program for test of the RTU

No	Menu Name	Specification	Description
12_8	Flygt default	Writable Alternative 0 = No 1 = Yes	Resets all settings to default.
13	Show more menues	Writable Alternative 1 = No 2 = Yes	Shows hidden menus
14	Show more menues (password)	Writable	Shows hidden menus when password function is enabled. Enter password!
15	¤ Language	Writable Alternative 0 = English 1 = Deutsch 2 = Nederlands 3 = Français 4 = Dansk 5 = Svenska 6 = Norsk 7 = Español 8 = Magyar 9 = Suomi 10 = Italiano 11 = PycckNN 12 = Polski	Select display language.

11. Appendix - Configuring a TD-33 modem

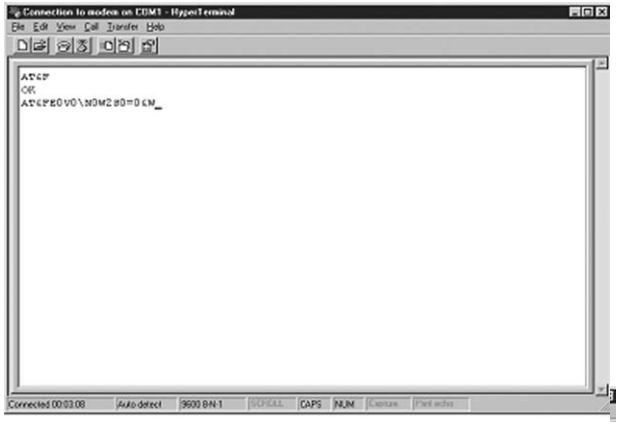
Start Windows Hyperterminal.

Select and configure the COM-port to which the modem is connected.

- Bits per second: 9600 (or another speed you want to use)
- Data bits: 8
- Parity: none
- Stop bits: 1
- Flow control: Hardware

Type "AT&F" and press Enter. The modem will answer with "OK".

Type in the initialisation string: E.g. AT&FE0V1\N0W2 S0=0&W. and press Enter.



The init-string must be permanently stored in the modem: To do this:

- Append "&W" to your init-string or
- Type "AT&W" after entering the init-string

12. Appendix C: Modems and initialization strings

12.1. RTU versus MTC-COM

The following modem combinations and configurations will be possible to use. Pre-configured modems must use initialisation strings as listed below:

Modem in RTU	**MTC-COM Baudrate**	**Modem in MTC-COM**				
		CourierV90 Pre-config.	**TDK 2814 Pre-config.**	**TDK 5660 Pre-config.**	**TD22 Pre-config.**	**TD33 Pre-config**
Westermo TD-33	4800	OK	OK	OK	OK	OK
Siemens TC35	4800	OK	NOT POSSIBLE TO USE	OK	OK	OK

12.2. RTU versus AquaView

The following modem combinations and configurations can be used. Pre-configured modems must use initialization strings as listed below:

Modem in RTU	**AquaView Baudrate**	**Modem in AquaView**		
		TD-33 Pre- configured	**TD-33 Factory settings**	**CourierV. Everything Factory settings**
Westermo TD-33 Factory Settings	2400	Not tested since factory settings is ok	OK	OK
	4800	Not tested since factory settings is ok	OK	OK
	9600	Not tested since factory settings is ok	OK	OK
	19200	Not tested since factory settings is ok	OK	OK
Siemens TC35	2400	OK	NOT RECOMMENDED	NOT RECOMMENDED
	4800	OK	OK	OK
	9600	OK	OK	OK
	19200	OK	OK	OK

12.3. Initialization strings

Modem	Initialization string in RTU	Initialization string in MTC-COM
Siemens TC-35	AT+CBST=0,0,1 AT+IPR=9600 ATV1	
Westermo TD-33	AT&FE0V1 \N0W2 S0=0	AT&FE0V0 \N0 W2 S0=0 AT+MS=V34,1,300,4800,300,4800
Westermo TD-22		AT&F1E0V0 F5&C1&D2 \N0 S0=0
TDK 5660		AT &FE0V0 %C0 \N0 W0 S0=0+MS=11,1,300,4800,0,0
TDK 2814		AT &F E0 V0 \N0 %G0 %E0 %C0 -K0 S0=0
Courier V. Everything		AT &F1 E0 V0 &B1 &N0 &M0 &K0 X4
Courier V. Everything		AT &F1 E0 V0 &B1 &N4 &M0 &K0 X4 (only in combination with TC-35)

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